# *The Biology of Photoreception*

Edited by D.J. Cosens and D. Vince-Prue

*Cambridge University Press; Cambridge, 1983*

610 pages. £42.50, $84.50

The perception of light by a wide range of biological systems is the theme of this symposium of the Society for Experimental Biology originally held in the University of East Anglia in September, 1981, although there has been some revision of the contributions since that date. The accent is on sensing the environment rather than on the transduction of energy so that only two of the 23 contributions are devoted to photosynthesis which is discussed in relation to the pigment protein complexes and the events occurring at the reaction centres of the photosystems in bacteria and plants. In contrast, six contributions examine the various aspects of phytochrome activity in plant systems ranging from a consideration of function based on the properties of the red and far-red forms of the pigment to a role in regulating cytosolic calcium concentrations. A further three papers are concerned with various blue-light effects attributable mainly to flavin photoreceptors. Retinoid photoreceptors and associated processes are considered in seven papers, including one on the *Halobacterium* pigments. One paper is devoted to the stentorin photoreceptor of the protozoan *Stentor*.

However, this analysis of the contents masks much of the wide interest of this book which concerns itself with topics as far apart as the perception of polarised light for navigation in insects, the swimming of *Chlamydomonas* 'in the breaststroke style', the excited state of polyenes and flavins and the events consequent on excitation of rhodopsin.

Each paper attempts to summarise the current position in the field under discussion with the inclusion of references to recent reviews rather than simply to describe the authors most recent experiments. The book, therefore, gives a good summary of our knowledge of photoreception as seen from a general biological viewpoint. The standard of contributions is high.

J. Prebble

# *Toxins as Tools in Neurochemistry*

Edited by F. Hucho and Yu.A. Ovchinnikov

*Walter Gruyter; Berlin and New York, 1983*

xiv + 368 pages. DM 180.00

This volume represents the proceedings of a meeting in West Berlin, March 22–24, 1983. The participants were almost exclusively from Germany and the USSR, and the articles are presented as 'camera-ready' type. The intention was apparently to review established work and report on new material, but most authors have chosen to describe only their own work in any detail. The 28 chapters are grouped into four sections: Sodium channels, Palytoxin, Acetylcholine receptors, and a miscellaneous section which includes Calcium channels and assorted toxins and venoms. Most

papers describe work on vertebrate preparations (node of Ranvier, electroplax, skeletal muscle, neuroblastoma cells), rather than the squid axon which has dominated studies in this field in Britain and the USA.

Toxins acting on sodium channels can be classified into blockers, modulators, and inactivation inhibitors, with some overlap between the last two groupings. There is a clear account of blocker action (TTX, STX, local anaesthetics; Ulbricht), and several very interesting articles on the modulator alkaloid batrachatoxin (BTX), which apparently converts normally inactivating channels into partially or non-inactivating ones (Naumov; Yelin et al.; Khodorov; Soldatov et al.). Palytoxins, from species of the coral coelenterate *Palythoa*, are among the most potent membrane-active agents yet described. Although initially regarded as specific neuro- and cardio-toxins, they are now shown to increase cation permeability of membranes in general, possibly by interaction with the Na-K ATPase, turning the sodium pump into a pore (Beress; Tesseraux et al.; Stengelin et al.). Future studies of these toxins should be of great interest.

The molecular structure of the acetylcholine receptor is now known in some detail, and several articles here show how analysis of toxin structure can give clues about receptor geometry. Use of a battery of physical and chemical techniques shows that the toxin–ACh receptor interaction involves several regions of the toxin molecule, but no single region is essential (Saenger et al., Tsetkin et al., Muhn et al., Chibber et al., Surin et al., Bystrov et al.). The final section includes a useful review of the pharmacology of neuronal Ca channels (Kostyuk) and reports on several further toxins.

There are some rewarding nuggets here for the conscientious prospector, and the book is a timely guide to studies in progress in Germany and the USSR. As a review of the field, the book would have been much more useful if each section had begun with an authoritative summary and overview. As it is, only specialist toxicologists are likely to want to buy the book.

N.J. Abbott

# *Biosynthesis and Function of Plant Lipids*

Edited by W.W. Thompson, J.B. Mudd and M. Gibbs

*American Society of Plant Physiologists; Rockville, MD, 1984*

xiii + 268 pages. $15.00

This book is based on the proceedings of the 6th annual symposium in botany held at the University of California, Riverside, in January 1983. The proceedings contain 15 contributions on a wide variety of topics on plant lipids. The first contribution by Stumpf and Shimakata reviews the current stage of knowledge of the molecular structure of plant fatty acid synthetase. It serves as a good overview for those researchers new to the area especially considering the contribution made by the Davis group to this area of research. The following chapters are concerned with (1) Phospholipid metabolism in post-germinating castor bean as a system to characterize and compartmentalize the enzymes involved; (2) Galactolipid biosynthesis in leaves – particularly addressing the difference between metabolism in 16:3 and 18:3 plants; (3) Phosphatidylcholine as an intermediate in polyunsaturated triacylglycerol biosynthesis; (4) The fatty acid composition of chloroplasts and their effect on thylakoid appression and primary photochemistry. There are several contributions on the structural role of plant lipids ranging from a general consideration to specific roles in the molecular organization of photosynthetic membranes and membrane fusion in salt glands.

Surprisingly the book contains a contribution on the influence of lectins on plant membranes, aimed